

The Analysis of The Mathematical Problem-Solving Ability of High School Students Reviewed from Personality Types of The Rational and Artisan

by Nanang Supriadi

Submission date: 03-Dec-2019 03:45PM (UTC+0700)

Submission ID: 1225895358

File name: 25. Putra_2019_J._Phys.___Conf._Ser._1155_012039.pdf (357.05K)

Word count: 3837

Character count: 19972

PAPER • OPEN ACCESS

The Analysis of The Mathematical Problem-Solving Ability of High School Students Reviewed from Personality Types of The Rational and Artisan

6

To cite this article: R W Y Putra *et al* 2019 *J. Phys.: Conf. Ser.* **1155** 012039View the [article online](#) for updates and enhancements.**IOP | ebooks™**

Bringing you innovative digital publishing with leading voices
to create your essential collection of books in STEM research.

Start exploring the collection - download the first chapter of
every title for free.

The Analysis of The Mathematical Problem-Solving Ability of High School Students Reviewed from Personality Types of The Rational and Artisan

R W Y Putra^{1*}, N Supriadi¹, M Ilmiyana¹, Khoiriah¹, D Fitriani¹, A F Aziz¹, T Solihat¹

¹Department of Mathematics Education, Faculty of Teacher Training and Education, Islamic Universitas Raden Intan Lampung, Majene, 35131, Indonesia

* Rizkiwahyuyp@radenintan.ac.id

Abstract: The aim of this study is to determine how to analyze the mathematical problem-solving ability of high School students reviewed from personality types of the Rational and Artisan. This research is a descriptive qualitative. The subject of this study consists of 2 students of class X in the city of Liwa, Lampung Barat. Retrieval of the subject using the purposive sampling, ie sampling technique with certain considerations. The stages used is the stage proposed by Polya. Data collection techniques were triangulation techniques by comparing the results of test problem-solving ability and results of the interview. The results of the discussion can be concluded that the analysis of students' problem-solving abilities type of personality rational is better in comparison with the type of personality of the artisan. Because this type can already be passed through all stages, from understanding the problem, planning, finish planning, and looking back the answer with good, personality types this tend to be quick and can apply ideas in solving a problem, while the students with the type of personality of the Artisan have not passed all indicators, students do not write down information on the matter and don't look back the answer, problem-solving abilities with personality type artisan too rushed and less thorough in doing a matter, so at the stage of completing the plan answers less than the maximum.

1. Introduction

One of the characteristics of the world in this globalization era, the development of science and technology is getting better in showing the progressionpencapaiannya. The rapid development of various spheres of life one of them is the field of education. Education should be a top priority in the development of the nation and needed a good quality education so as to create the process of education that is smart, open, competitive and democratic as well as to develop the ability of students [1], one of which is the field of mathematics.

Mathematics is a subject that is very effectively used in the process of solving the problem. This research studied the theory of problem-solving that made George Polya, where the Polya carry out the steps of solving a problem in a more systematic way. He suggests problem-solving is not only interesting but also is meant to convince about the concept has been learned when the learning process is ongoing [2].

According to the results of observation of the beginning of the problem-solving ability of students of MAN 1 west Lampung still low, the students tend to be difficulty in solving the problem. proven to be of value students are below the KKM with a percentage of 56,82 % of the 44 students. This fits well with research Pawestri Dian Purnama Sari, and Sugiman, which shows that the ability of solving



Content from this work may be used under the terms of the Creative Commons Attribution 3.0 licence. Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.

Published under licence by IOP Publishing Ltd

problems that owned is still relatively low, it is evident from the many students who have problem-solving ability in the low category is more than 50%, of the students who have problem-solving abilities that high only 11, 77 %, students have the ability of solving problems is by 35, 29 % 52, 94 % of students have problem-solving ability low [3].

There are 2 barriers that make students unable to answer correctly, i.e.: problems in understanding the concept of air-relation to understand the meaning of the perma-blame game, and problems in the mathematical process that consists of transformation, skills, and processes [4]. Students in solving a problem need motivation. Motivation and ability are factors that originate from within the student so that it can be influenced by the characteristics of the owned. Characteristics of students can be regarded as the personality of the student, the personality of the students it is very diverse. So it is very interesting if this research is studied based on the personality of which is owned by the student.

There are several previous studies that have tried to see the connection between the difference of behavior in the process of learning some of the research conducted by Abdul Aziz indicates that there are different characteristics on the learning process [5]. By being aware of the differences in conditions on each student, then the teacher can give the method of teaching is best for each individual student, and problem-solving ability was investigated based on the personality types that have been classified based on the classification by David Keirse.

Research on problem-solving has been proposed by Rizki Wahyu Yunian Putra entitled "analysis of the process of critical thinking in solving math problems is reviewed of personality types guardian and idealist" [6]. The results of the research indicate that in solving the problems of math students of that type of the personality of the guardian tend to belong in obtaining information. While the student's personality type the idealist tend to be cautious in answering a question and does not require a long time to solve the problems. The difference of this research is the student who has the type of personality studied in solving mathematical problems. In this study, using the indicator according to the Polya while the research Rizki using the indicator according to Wallas. The importance of doing this research is to determine the ability to solve problems based on the personality types of the rational and artisan. Furthermore, in an analysis of how the ability of each of the personality types researched.

The above shows that there is a correlation between each personality type and the ability of students' mathematical problem solving so that students with type a personality will have the ability to solve a problem that different anyway. Based on the background described above then can be defined that the formulation of the problem in this study is how the analysis of the mathematical problem-solving ability of high school students is reviewed of personality types of the rational and artisan?

2. Literature Review

Mathematics is a science about the structure of organized well [7]. Mathematical problem solving is a process that uses the power and benefits of math in solving problems, which is also a model of the discovery of the solution through the stages of problem-solving [8]. Problem-solving ability is an attempt to find a way out achieving a goal, also requires the readiness, creativity, the ability, and the knowledge and can apply in everyday life [9].

The ability to learn to solve everyday problems through the help of mathematical concepts, applying a variety of strategies and reflect on the process of solving the problem, This is the problem-solving ability of mathematics [10]. Khaeruddin *et al* stated that problem-solving skills can also be defined as the ability of individuals or groups to find the answers based on prior understanding to meet a normal situation. To improve problem-solving abilities need to be developing skills to understand the problem, create a mathematical model, solve the problem and interpret the solution. The factors that affect problem-solving, namely (1) the Background of learning mathematics (2) students' Ability in reading (3) Persistence or accuracy of students in doing math problems (4) the Ability of the space and the factors of age.

Indicators-indicators that show math problem-solving according to Polya, which is used in solving the problem, namely 1) understand the problem (understanding the problem), 2) develop a plan of completion (devising a plan), 3) resolve the problem according to the plan (carrying out the plan), 4) check back (looking back) [11-12].

Type of human personality can be classified into 16 personalities. Next, there is the classification of personality done by David Keirse, a psychologist from California State University in 1984 in his book Please Understand Me I and II. Keirse classified into 4 types, namely, the Guardian, Artisan, Rational

and Idealist. This classification is based on 4 major dimensions that distinguish one person from others (Susanti And Maharani, 2016). The four dimensions are mutually opposite. Although the opposite actually, we have it all it's just that we are more likely to / comfortable in one particular direction that is known with the model of the "big four" which includes 4 dimensions, namely Extraversion (E) Versus Introversion (I), Sensing (S) Versus Intuition (N), Thinking (T) Versus Feeling (F), Judging (J) And Perceptive (P). Four scale preferences above, Keirsey and Bates (1984: 121-128) groups personality types into four types, namely personality type the Guardian, Artisan, Rational and Idealist.

3. Research Methods

This study the data used is qualitative data. Data is the result of the recording of the researcher, either in the form of facts or figures. Data collection techniques this required data collection methods in accordance with the problem studied, performed with the triangulation method, i.e., comparing the test data written test interview so that the data obtained to determine the ability of mathematical problem-solving ability valid. The researchers conducted a triangulation of the results of this study, namely the search for the suitability of one source at two stages i.e. written test and the test phase of the interview.

The Data presented were obtained from a study of 2 students of class X of the first semester. The determination of the research subject based on the results of a personality test MBTI has been done by the students of class X in the City of Liwa Lampung Barat, furthermore, how the settlement of students in solving mathematical problems. The selection of research subjects based on several criteria, namely, (1) the student has received materials (2) students already have experience of learning enough so that it can complete the questions given (3) the students of class X in enabling them to solve the problem according to the indicators given (4) the availability of students to become the subject. Retrieval of the subject using purposive sampling technique.

Procedure selection of subjects in this study, namely (1) setting up the test Myer Briggs type indicator (MBTI); (2) Give the MBTI test to all students in grade X; (3) grouping students based on the dimensions of the Myer Briggs; (4) choose 2 of the research subject based on the dimensions of personality Myer Briggs; (5) classifying the subject into personality types; (6) establish criteria for the selection of research subjects; and (7) to choose a subject of research. Data collection in this research is done by giving the written test and interview of the results that have been done of the subject, namely : (a) to choose 2 students that consist of 1 people with the personality types of the rational and 1 student with the type of personality of the artisan; (b) determine the time of data retrieval by asking the advice of teacher of mathematics to consider the time and study schedule; (c) carry out the retrieval of the first data the ability of mathematical problem solving are given; (d) data retrieval of the second interview with questions aimed to see students ' problem solving abilities; (e) analyzing the data 2 of the person; (f) comparing the results of the retrieval of the first data and the second of each research subject; (g) summing up the results of the analysis of the mathematical problem solving ability of the students on the first data, namely a written test with second data, namely the interview of each research subject; (h) comparing the results of the analysis of the data on each research subject to get the data conclusions on the mathematical problem solving ability in each type of personality. To ease releasing of the process of data analysis and discussion, 2 people the student is given a description as follows: students with the initials AH that students with personality type Rational and students with the initials RP that students with personality type Artisan The flow of research as the following chart:

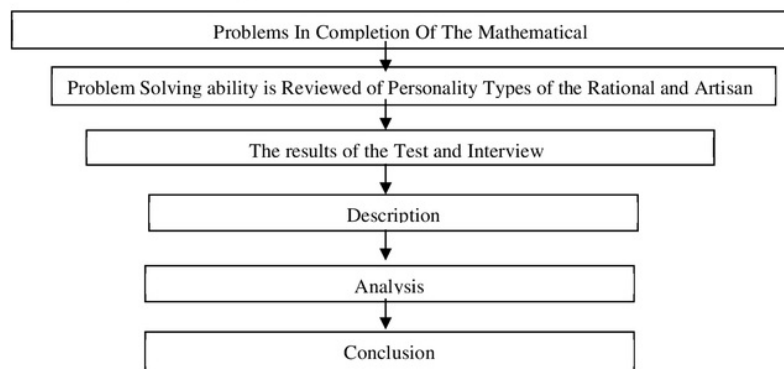


Figure1 The flow of the research

4. Results and Discussion

Data collection was performed after obtained students who meet the criteria of the research subject and obtained 2 students consisting of 1 student with personality type rational (AH) and 1 student with personality type is the artisan (RP). Next carry out the data retrieval problem solving ability with the use of interview from the results of the written test of problem solving ability on 2 students. After the analysis of the data is based on the indicator of problem-solving ability, namely the theory of Polya, which include; stage (1) understand the problem, (2) planning issues, (3) solve problems, (4) look back at the answers. After analyzing the results of interviews about the ability of students' mathematical problem solving with the technique of triangulation, namely data retrieval first, then do data retrieval the second.

This is done to see the validity of the data the ability of students' mathematical problem-solving in data retrieval. Furthermore, if there are different data then will be reduced. So, it can be concluded an overview of the result of mathematical problem-solving skills based on personality type respectively.

Data analysis the mathematical problem-solving ability in each subject of study 1 students with personality type rational and 1 student with the type of personality of the artisan. Based on the indicator of the ability of mathematical problem solving, then the obtained data on the mathematical problem-solving ability of students in mathematical problem solving that is valid. As for the data of mathematical problem-solving skills which are valid for the students with the type of personality rational and artisan are presented in Table 1 below.

Table 1. Data ability students' mathematical problem solving that is valid with the type of personality

| Indicators of problem-solving ability | Rational (AH) | |
|---------------------------------------|---|--|
| | Problem-solving abilities stage of the written test | The ability of problem-solving stages of the interview |
| Stage understand the problem | The students were able to write down the terms of what is known in the questions correctly. | Students are able to tell what he has written correctly and precisely. |
| Stage plan | Students are able to plan by making models of the math correctly. | Students are able to tell the plan or the steps that have been he wrote with create model math correctly although it was confused in doing it. |
| The stage of completion | The student is able to complete the matter in accordance with the planning correctly. | The students were able to resolve the matter of the appropriate planning with the right. |
| Stage look back | The students were able to make conclusions and find another way to solve the problem. | Students are able to make a conclusion correctly and are able to retell from what he has written. |

Based on table 1 it can be concluded that students with personality type rational on the indicator of the stage of understanding the problems the students were able to write down the information on the matter correctly, on the second indicator students are able to plan to make a model of maths with the right although a little confused while working on it, the indicator of the stage of completing the problem the student is able to complete the appropriate planning and the stage of looking back, students can write down the conclusion and find another way to solve the problem.

Table 2. Data ability students ' mathematical problem solving that is valid with the type of personality Artisan (RP)

| Indicators of problem-solving ability | Problem-solving abilities stage of the written test | The ability of problem-solving stages of the interview |
|---------------------------------------|--|--|
| Stage understand the problem | Students do not write down the terms of what is known but write down the things what is being asked of the given problem. | Students do not write down what it is known in the matter but could mention the things asked in the question. |
| Stage plan | Students are able to plan by making models of the math correctly. | Students are able to tell the plan or the steps that have been he wrote with create model math correctly although it was confused in doing it. |
| The stage of completion | The student is able to complete the matter in accordance with the planning but the results are less precise and less than the maximum. | The students were able to resolve the matter of the appropriate planning but the result is less than the maximum. |
| Stage look back | Students write the conclusion of a matter that he is working on but can't find any other way in resolving the problem. | Students write down the conclusion of the matter he's working on, and could mention when interviewed but could not mention another way in solving the problem. |

From table 2 it can be concluded that students with personality type artisan on the indicator of the stage of understanding the problem of students not writing down information on a matter of right, on the indicator to the two students able to plan to make a model of maths, on the indicator of the stage of completing the problem the student is able to complete according to the plan but less than the maximum and phase look back students can write down the conclusion, yet students do not find another way to solve the problem.

Based on the results of data analysis based on stage according to Polya, namely the stage of understanding the problem, plan, solve, and look back which have been outlined, then the data of mathematical problem-solving ability in terms of personality type David Keirse is as follows :

a. Students ' problem solving abilities with personality type rational

Based on the results of the description and analysis of the Students with the personality type rational is able to understand the problem with the write down and mention what is known and what is asked in the question with precise and correct. Student's personality type rational is able to plan the problem with writing model mathematics appropriately and correctly. Students' personality type rational is able to resolve the issue of conformity planning. Students' personality type rational is able to re-examine the answers and make a conclusion correctly and precisely.

b. Students ' problem-solving abilities with personality type artisan

Based on the results of the description and analysis of the students with the type of personality of the artisan in the stage of understanding the problem is not writing down things that known in the matter. Students' personality type artisan in the stage of plan completion can write it down although not exact. Students' personality type artisan in the completion stage was able to complete the appropriate planning although less than the maximum. Students' personality type artisan does not make the conclusions and doesn't check answers that he did.

5. Conclusion

Based on the results of research and discussion that has been described previously, it can be concluded that the analysis of the problem-solving ability of high SCHOOL students is reviewed of personality types rational and artisan. Of the 2 personality types it can be seen that the type of personality that has the ability of mathematical problem solving namely personality type Rational, because the subject of this type is able to pass all indicators of the breakdown of the given problem, it can be said that the score of mathematical problem-solving ability of the subject of the type Rational has a level of problem-solving ability that is higher than the subject of the artisan.

References

- [1] V. D. Susanti 2018 Analisis Kemampuan Kognitif Dalam Pemecahan Masalah Berdasarkan Kecerdasan Logis Matematis *J. Mat. Dan Pendidik. Mat.* **3** 1
- [2] D. Sartika & N. A. Humairah 2018 Analyzing Students' Problem-Solving Difficulties in Modern Physics *J. Phys. Conf. Ser*
- [3] P. Purnamasari & Sugiman 2016 Analisis Kemampuan Pemecahan Masalah Matematika Siswa Kelas XI SMK Muhammadiyah 1 Patuk Pada Pokok Bahasan Peluang Analysis Ofmath Problem Solving Ability Student Grade XI SMK Muhammadiyah 1 Patuk On Probability Discussion *J. Pendidik. Mat.* **5** 4
- [4] R. W. Utari & D. U. Wutsqa 2014 Analisis Kemampuan Pemecahn Masalah MTK Dan Self-Efficacy Siswa SMP Negeri Di Kabupaten Ciamis *J. Ris. Pendidik. MTK.* **4** 2
- [5] A. Aziz 2014 Proses Berpikir Kreatif Dalam Pemecahn Masalah Matematika Ditinjau Dari Tipe Kepribadian Dimensi Myer-Briggs Siswa SMP Kelas VII MTs Suralaga Lombok Timur Tahun Pelajaran 2013/2014 *Univ Sebelas Maret*
- [6] R. W. Y. P. Putra 2017 Analisis Proses Berpikir Kreatif Dalam Memecahkan Masalah Matematika Ditinjau Dari Tipe Kepribadian Guardian Dan Idealist *Nabla Dewantara J. Pendidik. Mat.* **2** 1
- [7] Masrukan, B. E. Susilo & A. D. Persuri 2015 Analysis Mathematical Communication Ability Through 4K Modul Based On 7h Graders Personality Types *Int. J. Educ. Res.* **3** 7
- [8] M. N. Suhito & Masrukan 2014 Analisis Kemampuan Pemecahan Masalah Geometri Dan Karakter Siswa SMP Kelas VII Melalui Pembelajaran Model 4K *J. Kreno.* **5** 2
- [9] R. Agustina 2014 Penyelesaian Masalah Matematika pada Tipe Kepribadian Phlegmetis *AKSIOMA J. Progr. Stud. Pendidik. Mat.* **3** 2
- [10] A. Suharti 2013 Improvement Of Power Mathematical In Learning Math Through Learning Model Combined *Int. J. Sci. Technol.* **2** 8
- [11] R. Widyastuti 2015 Proses Berpikir Siswa Dalam Menyelesaikan Masalah Matematika Berdasarkan Teori Polya Ditinjau dari Adversity Quotient Tipe Climber *Al-Jabar J. Pendidik. Mat.* **6** 2
- [12] Agustini, R & Suyatna, A 2018 Developing Inquiry-Based Practice Equipment of Heat Conductivity to Foster the Students' Critical Thinking Ability *Jurnal Ilmiah Pendidikan Fisika Al-BiRuNi*, **7** 1 49–57

The Analysis of The Mathematical Problem-Solving Ability of High School Students Reviewed from Personality Types of The Rational and Artisan

ORIGINALITY REPORT

12%

SIMILARITY INDEX

%

INTERNET SOURCES

12%

PUBLICATIONS

%

STUDENT PAPERS

PRIMARY SOURCES

1

N A Rusyda, K Kusnandi, S Suhendra. "A Cognitive Analysis of Students' Mathematical Problem Solving Ability on Geometry", Journal of Physics: Conference Series, 2017

Publication

4%

2

S A Widodo, Istiqomah, Leonard, A Nayazik, R C I Prahmana. "Formal student thinking in mathematical problem-solving", Journal of Physics: Conference Series, 2019

Publication

4%

3

"Approaching Problem-Solving Skills of Momentum and Impulse Phenomena Using Context and Problem-Based Learning", European Journal of Educational Research, 2019

Publication

1%

4

Rubaitun Rubaitun. "IMPLEMENTATION OF MODEL-ELICITING ACTIVITIES TO IMPROVE THE ABILITY OF MATHEMATICAL PROBLEM

1%

SOLVING", (JIML) JOURNAL OF INNOVATIVE MATHEMATICS LEARNING, 2018

Publication

5

K Mawardi, E S Dewi, S Asmah, T N Pratiwi, U I Sari, F G Putra, Widayanti. "Developing Islamic-Nuanced Linear Algebra Module with Guided-Inquiry approach in the Matrix Material", Journal of Physics: Conference Series, 2019

Publication

1%

6

R Widyastuti, WA Lestari, U Fadhilah, R Nurfarida, Rosidin. "The Ability to Understand Students' Mathematical Concepts Through the PDEODE Cooperative Learning Model Based on Assessment for Learning (AFL)", Journal of Physics: Conference Series, 2019

Publication

1%

Exclude quotes On

Exclude bibliography On

Exclude matches < 1%